RDT&E BU	J DGET I	ITEM JU	JSTIFIC	ATION	SHEET	(R-2 Ex	hibit)		DATE FEBRUARY	2002
RDT&E, Defense Wide/BA 3				_	m Technology	Support				
COST (In Millions)	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007		Cost to Complete	Total Cost
Total Program Element (PE) Cost	48.852	56.011	49.015	38.894	39.722	40.568	41.296		Continuing	Continuing
Combating Terrorism Technology Support (CTTS)/P484	48.852	56.011	49.015	38.894	39.722	40.568	41.296		Continuing	Continuing
DERF		12.000	70.000	19.000	3.000	11.000	0.000			

(U) A. Mission Description and Budget Item Justification

(U) BRIEF DESCRIPTION OF ELEMENT

(U) P484, Combating Terrorism Technology Support (CTTS). This program develops technology and prototype equipment that address needs and requirements with direct operational application in the national effort to combat terrorism. Projects support antiterrorism, counterterrorism, intelligence and terrorism consequence management activities to: conduct tactical operations; protect military forces, civilian personnel, installations, infrastructure elements and the general populace from terrorist attack; detect, neutralize, and mitigate the effects of conventional and unconventional devices; conduct surveillance and tracking of terrorists; conduct threat and incident assessments; and process and disseminate information. The program integrates Defense advanced development efforts with government-wide and international efforts to combat terrorism. The Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict oversees and is responsible for execution of the CTTS program, which addresses Defense, interagency, and international combating terrorism technology requirements.

DDT 0 E DUDGET ITEM HIGTIEIGATION CHEET (D 1 EL:L:A)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terroris	m Technology Support
	PE 0603122D8Z	

(U) All projects are distributed among nine mission categories: Chemical, Biological, Radiological, and Nuclear Countermeasures; Explosives Detection; Improvised Device Defeat; Infrastructure Protection; Investigative Support and Forensics; Personnel Protection; Physical Security; Surveillance, Collection, and Operations Support; and Tactical Operations Support. This program is a non-system, advanced technology development effort that demonstrates the utility or cost reduction potential of technology when applied to combating terrorism requirements. It includes technology development and proof-of-principle demonstrations in field applications and coordination to transition from development to operational use.

(U) Project Number and Title: P484 Combating Terrorism Technology Support (CTTS)

(U) PROGRAM ACCOMPLISHMENTS AND PLANS

(U) FY 2001 Accomplishments:

(U) CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR COUNTERMEASURES. Demonstrated the utility of Fourier transform near infrared (FT-NIR) analysis for food adulteration detection. Developed and tested escape mask designs for DoD first article and qualification testing. Developed new training aids for canine pre-release detection of sarin devices. Developed guidelines for biological agent surface sampling in offices. Incorporated new mask filter material that provides protection against toxic industrial chemicals. Developed standard laboratory protocol for analysis of anthrax and plague in foods. Improved immobilized enzyme nerve agent detection capability. Demonstrated advanced biological protective system. Modified palmtop HAZMAT database to include chemical warfare agents. Developed aerogel formulations to increase effectiveness of chemical and biological agent sample collection. Developed and fielded enhanced human, animal and plant pathogens characteristics databases. Developed prototype urban dispersion model. Designed handheld low-level chemical detector. (\$5.600 million)

DDT 0 E DUDCET ITEM HICTIEICATION CHEET (D 1 E.L.L.L.)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support	
	PE 0603122D8Z	

- (U) EXPLOSIVES DETECTION AND DEFEAT. Delivered and fielded prototype ion mobility spectrometer explosives detector. Developed method to detect explosives from a five-foot standoff distance. Demonstrated ability to detect composition C-4 with nuclear quadrupole resonance (NQR) portal. Demonstrated NQR detection of ammonium nitrate in vehicles. Developed a prototype handheld, explosive detector pre-concentrator with improved sensitivity and versatility. Developed prototype flat-panel imager for a digital x-ray. Developed and fielded dilute-explosive-tile prototype to defeat large vehicle bombs (LVB). Developed and demonstrated software to integrate robotic modular PC-based control architecture. Developed and delivered interactive IED database. (\$4.353 million)
- (U) INFRASTRUCTURE PROTECTION. Delivered a developmental hacker publication database and site replication tool in response to an urgent operational need. Developed a tool to detect, read and characterize flash-read-only memory chips embedded in modems, computers, network printers, personal digital assistants and cell phones. Developed and delivered water pipeline assessment and data analysis tools. Developed and fielded a risk assessment methodology for dam operators and owners. (\$2.500 million)
- (U) INVESTIGATIVE SUPPORT AND FORENSICS. Developed and delivered First Responder's Toolset prototypes. Developed and demonstrated proof-of-concept and protocols for stable isotope ratio sourcing of explosives. Developed and fielded magnetic nanoflake fingerprint powders technology. Developed techniques to recover DNA evidence from processed fingerprints. (\$3.800 million)
- (U) PERSONNEL PROTECTION. Developed and fielded an advanced transparent portable shield for personnel protection. Designed reduced weight, composite hybrid vehicle armor. Developed and fielded advanced models to evaluate blast effects on vehicles and to facilitate the design of transparent armor. Developed and demonstrated prototype body armor cooling system. (\$2.630 million)

DDT 0 F DUDCET ITEM INCTIFICATION CHEET (D 4 FL.L.L.)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support	
	PE 0603122D8Z	

- (U) PHYSICAL SECURITY. Demonstrated the effectiveness of a mobile, gamma ray imaging system for vehicle/cargo inspection at entry control points. Demonstrated the ability to retrofit a U.S. European Command facility for improved blast protection. Developed and fielded a vehicle inspection checklist for entry point detection of improvised explosive devices (IED). Prototyped quick reaction detection sensors for improved perimeter intrusion detection. Designed and developed a ground surveillance radar for perimeter intrusion detection system. Prototyped high-volume flat mail and parcel scanner for IED detection. Designed and developed a semi-automated under vehicle inspection system. Developed interim military construction standards for a new DoD antiterrorism/force protection security-engineering manual. Designed and developed a vessel identification and positioning system for port security. Completed development of a man-portable, motion-activated electronic trip flare. Designed and developed an advanced entry point vehicle/driver identification system with Arabic license plate reader and access to terrorist databases. Developed a perimeter early warning and intruder detection system using thermal imaging and forward-looking infrared (FLIR). Designed and developed a blast effects estimation model for vulnerability assessment. (\$16.337 million)
- (U) SURVEILLANCE, COLLECTION, AND OPERATIONS SUPPORT. Developed and fielded a system that uses name recognition technology across multiple data sources to identify known terrorists attempting entry into U.S.. Developed and fielded Name Search Reference Library that permits searches involving unfamiliar and complex cultural naming patterns. Developed and fielded a full-motion, wireless video transmission system. Improved quality of Facial Recognition Technology resulting in turnkey access control system being commercially available (\$5.200 million)
- (U) TACTICAL OPERATIONS SUPPORT. Developed innovative cost-effective manufacturing techniques for the production of low-halo image intensifier tubes. Successfully tested proof-of-concept small chemical agent detector for special operations. Completed prototype of a night vision sensor fusion system. Developed and demonstrated interim personnel navigation system that is independent of global positioning system (GPS) input. (\$4.565 million)

DDT 0 E DUDCET ITEM HICTIEICATION CHEET (D 1 E.L.L.L.)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support	
	PE 0603122D8Z	

(U) PROGRAM MANAGEMENT. Staffed the Combating Terrorism Technology Support (CTTS) Office, Arlington, Virginia. Aligned existing staff and added program staff members to provide program management oversight and technical support for all CTTS R&D projects. Augmented the CTTS program office with contract and financial management personnel. Includes management of an additional \$25 million in funds from other agencies; and management of cooperative research and development programs with the United Kingdom, Canada and Israel. Directed the program/project planning and execution for all projects including the daily management and reporting on more than 250 separate contracts and funding. Developed and implemented improvements for the automated approach to the Broad Agency Announcement (BAA) solicitation process, including the establishment of collaborative source evaluation and selection tools. Continued the planning and development of process efficiency and re-engineering analysis, encompassing a complete review of CTTS mission area management and reporting responsibilities internal to the organization and in support of external reporting requirements. (\$3.867 million)

(U) FY 2002 Plans:

- (U) CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR COUNTERMEASURES. Complete development of prototype toxic industrial chemicals, layered bed mask filters. Design a low profile escape mask. Evaluate the miniature multisensor water quality monitor. Research the viability and stability of eight BW agents in foods over a range of environmental conditions. Evaluate advanced preservative material for bacterial and viral BW agent samples. Develop standard laboratory protocols for analysis of five biological warfare (BW) agents in foods. Evaluate prototype handheld, low-level chemical detector. Determine effectiveness of prototype electrostatic decontamination system against actual CB agents. Peer review mass decontamination protocols. Evaluate initial performance of advanced building collective protection filtration materials. Laboratory test the modular portable NBC filtration system for small room protection. (\$11.374million)
- (U) EXPLOSIVES DETECTION. Research and evaluate new technologies for standoff detection of explosives. Validate NQR portal sheet explosive detection capability. Research canine ability to generalize from domestic to foreign explosives. Evaluate handheld detector for plastic explosives and triacetone triperoxide (TATP). (\$2.177 million)

DDT 0 E DUDCET ITEM HICTIEICATION CHEET (D 1 E.L.L.L.)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support	
	PE 0603122D8Z	

- (U) IMPROVISED DEVICE DEFEAT. Evaluate a developmental precision IED disruption device. Characterize and model foreign developed IED/LVB countermeasure tools. Begin design of next generation EOD robotic system. Test and evaluate a single-sided imaging system to diagnose IEDs in confined spaces. Develop field-portable, directional remote LVB disablement charges. Develop enhanced IED detection, diagnostic and render safe tools. Develop and test prototype of an urban explosive magazine. Demonstrate an automated in situ information system to access and extract threat assessment, render safe data and disposal procedures. Evalute prototype of an environmental monitoring system that links vital signs of bomb squad/EOD personnel and protective apparel temperatures to a central monitoring hub. Integrate a standoff connectivity and command unit with different sensors. Conduct extensive testing of non-intrusive detection systems. (\$3.477 million)
- (U) INFRASTRUCTURE PROTECTION. Beta test a software tool to model interdependencies of energy infrastructures. Continue development of method to remotely track an electronic file through a network. Complete development of and deliver an advanced communications firewall prototype for secure facilities. Develop a software application that automates the risk assessment methodology for dams. Complete research on encryption algorithm suite for supervisory control and data acquisition (SCADA) system protection and provide recommendations to industry. Complete an alert trend-change detection tool for protection of computer networks against autonomous malicious agents. (\$1.610 million)
- (U) INVESTIGATIVE SUPPORT AND FORENSICS. Test pulsed infrared beacon prototypes. Expand research on sampling for sourcing of explosives and organic materials using stable isotopic ratios. Complete testing of voice stress analyzer. Characterize peroxide-based explosives for post-blast forensics. Complete development of DNA recovery and analysis protocols, ink dating, float glass exams, latent print baseline evaluations and handwriting comparison of different character sets. Isolate additional identification segments from DNA. Complete validation of questioned document analysis and implement national automated system. Develop techniques for shredded document reconstruction and for sourcing documents to inkjet printers. Develop forensic protocols for evidence recovery in hot zones. Verify computer forensic tool performance and assess computer readback signals for forensic use. Begin development of next generation audio, visual and computer forensic tools. (\$3.785 million)

DDT 0 F DUDCET ITEM INCTIFICATION CHEET (D 4 FL.L.L.)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support	
	PE 0603122D8Z	

- (U) PERSONNEL PROTECTION. Complete development of methods to defeat enhanced tungsten carbide ammunition and counter the effects and lethality of sheet metal on non-armor piercing projectiles. Extend development of body armor cooling system to include heating capability. Evaluate vehicle blast model. Develop passive passenger restraint system for VIP vehicles. Begin development and testing of comprehensive standards for armored passenger vehicles. Apply composite armor concepts to full-scale applications. Evaluate enabling technologies for bullet countermeasure system. Initiate development of systems to detect and classify potential laser-enhanced threats to personnel. Initiate development of optical-based sniper detection system. (\$4.626 million)
- (U) PHYSICAL SECURITY. Complete development and field a man-portable, motion-activated electronic trip flare. Evaluate an advanced entry point vehicle/driver identification system with Arabic license plate reader and access to terrorist database access. Develop a small watercraft and a railcar inspection guide for explosives detection. Complete development of high-volume flat mail and parcel scanners for detecting IEDs. Complete development and demonstrate an automatic false alarm assessment and filtering system for perimeter intrusion detection. Complete development and demonstrate a perimeter early warning and intruder detection system using thermal imaging and FLIR. Test and evaluate a vessel identification and positioning system for port security. Conduct an operational evaluation of video detection and assessment systems for suspect vehicles. Develop research and testing based final construction standards for a new DoD antiterrorism/force protection security-engineering manual. Conduct developmental testing and evaluation of a prototype ground surveillance radar for perimeter intrusion detection system. Demonstrate proof of concept for and initiate development of a semi-automated under vehicle inspection system. Develop a backscatter radio frequency identification system for entry point screening and tracking of high value assets. Develop a lightweight, portable boom to protect ship defense zones. Develop a radio frequency identification system to tag and track designated assets. (\$14.590 million)
- (U) SURVEILLANCE, COLLECTION, AND OPERATIONS SUPPORT. Conduct pilot program that demonstrates specialized security and surveillance equipment that use facial recognition technology to identify terrorists. Complete development of a video exploitation toolkit that provides processing functions for video stabilization, video super resolution enhancement, heat and scintillation removal, and the construction of enhanced, panoramic still image mosaics from video streams, as well as multisensor fusion of real-time video. (\$5.768 million)

DDT 0 E DUDCET ITEM HICTIEICATION CHEET (D 1 E.L.L.L.)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support	
	PE 0603122D8Z	

- (U) TACTICAL OPERATIONS SUPPORT. Demonstrate rifle-mounted video and thermal image display. Demonstrate prototype personal navigation system in typical tactical environments where GPS is not available and transition to design hand-held system. Complete development and field hand-held chemical agent detector. Develop and field hardened breaching explosives storage containers. Evaluate advanced close-quarter battle carbine. Evaluate controlled breeching system capabilities. Determine feasibility of remotely characterizing transparent materials (such as windows). Begin concept development of advanced weapon sight that provides correction for wind effects. Reduce size and improve capabilities of tactical communications systems. Begin baseline evaluation of advanced, three-dimensional, through-wall imaging technology that provides user-friendly display for tactical forces. Initiate development of a microphone for use in very high background noise environments. (\$4.124 million)
- (U) PROGRAM MANAGEMENT. Provide program management oversight and technical support for all CTTS R&D projects including funds from other agencies and management of cooperative research and development programs with the United Kingdom, Canada and Israel. Direct the program/project planning and execution for projects and associated contracts using direct and indirect budget allocations; includes management and closeout of existing contracts and solicitation for new initiatives. Act as the interface to other government agencies for CTTS related initiatives and on-going and new projects. Establish goals, objective, and immediate revisions to plans that will reinforce interagency and international participation for the identification and prioritization of CTTS mission area requirements. Enhance the CTTS automated approach to the BAA solicitation process. Review and revise existing process and execution plans for CTTS mission area management and internal and external reporting responsibilities. (\$4.480 million)

(U) FY 2003 Plans:

(U) CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR COUNTERMEASURES. Evaluate and field the low profile escape mask. Validate standard laboratory protocols to analyze eight BW agents in foods. Complete development of database incorporating viability and stability of eight BW agents in foods over a range of environmental conditions. Demonstrate prototype advanced aerogel-based sample collection system with improved chemical and biological agent capture efficiency. Test prototype building filters based with advanced filtration materials at domestic and overseas sites. Complete testing and transition modular portable NBC filtration system for small room protection at domestic and overseas sites. (\$3.599 million)

DDT 0 E DUDGET ITEM HIGTIEIGATION CHEET (D 1 EL:L:A)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terroris	m Technology Support
	PE 0603122D8Z	

- (U) EXPLOSIVES DETECTION. Integrate multiple explosives and weapons detection technologies into one portal. Determine feasibility of NQR to detect TNT in vehicles. Characterize NQR enhancements for false alarm reduction in computed tomographic explosive detection systems. Develop methods to improve canine handler selection and training. Continue development of technologies for standoff detection of explosives. Develop techniques to detect suicide bombers. (\$2.665 million)
- (U) IMPROVISED DEVICE DEFEAT. Complete development of a portable one-sided x-ray system, next generation EOD robot system, and a IED disruptor. Complete enhancement of directional remote LVB disablement charges and IED detection, diagnostic, and render safe tools. Develop target recognition algorithms for detection and identification of potential IED components. Test an urban explosive storage magazine and environmental portable monitoring system. (\$4.187 million)
- (U) INFRASTRUCTURE PROTECTION. Begin to develop methods to protect commercial energy infrastructure systems to non-lethal weapons and technologies. Develop tools to monitor propagation of malicious computer software code, as well as to surveil and defend external networks against large-scale attacks. Complete SCADA protection algorithm suite. (\$2.002 million)
- (U) INVESTIGATIVE SUPPORT AND FORENSICS. Characterize foreign explosive samples for forensic purposes. Continue isolation of additional identification segments from DNA. Complete hyperspectral document imager prototype and standardized latent print evaluation criteria. Evaluate developmental computer forensic tools. Continue to develop next generation audio, visual, and computer forensic tools. Demonstrate link analysis of computer data through readback signals. Design passive RF vehicle tag. Develop components for retrieval and handling of encrypted incident management, interagency radio communications tools, and terrorism-related telecommunications information. (\$4.548 million)
- (U) PERSONNEL PROTECTION. Demonstrate full-scale composite armor applications in selected vehicle components. Introduce enabling technologies for bullet countermeasures into system design. Demonstrate practical application of laser and sniper detection and warning concepts. (\$5.532 million)

DDT & F DUDGET ITEM HIGTIFICATION CHEET (D 2 FK.K.A)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	URE
RDT&E, Defense Wide/BA 3	Combating Terroris	m Technology Support
	PE 0603122D8Z	

- (U) PHYSICAL SECURITY. Demonstrate prototype ground surveillance radar for perimeter intrusion detection system. Develop and demonstrate a high-volume flat mail and parcel scanner that detects radiological material. Complete development of a semi-automated under vehicle inspection system. Complete and field a backscatter radio frequency identification system for entry point screening and tracking of high value assets. Complete development of construction standards for a new DoD antiterrorism/force protection security-engineering manual for military construction. Evaluate a vessel identification and positioning system for port security overseas. Develop and demonstrate high-energy x-ray and enhanced gamma radiation vehicle and cargo inspection systems for entry point screening. Test a lightweight, portable boom to protect ship defense zones. Demonstrate a radio frequency identification system to tag and track designated assets. Demonstrate a backscatter radio frequency identification system for entry point screening. Complete a personnel-screening guide for entry point screening. Develop a rail car inspection guide for explosives detection. (\$13.907 million)
- (U) SURVEILLANCE, COLLECTION, AND OPERATIONS SUPPORT. Continue to integrate facial recognition technology into surveillance systems. Improve intelligence analyst automation tools for dealing with large volumes of data. Improve the capabilities for clandestine collection and enhancement of video and audio surveillance by expanding previously developed video exploitation toolset. Develop increased capability for tagging, tracking and locating. Develop advanced tactical systems to degrade, disrupt, deny or destroy adversary information systems. (\$3.709 million)
- (U) TACTICAL OPERATIONS SUPPORT. Demonstrate design improvements of advanced close quarter battle carbine to existing weapons in the inventory. Evaluate effectiveness of prototype transparent material characterization systems. Complete development of and test microphone for use in very high background noise environments. Demonstrate promising three-dimensional through-wall technologies for continued development. (\$4.945 million)
- (U) PROGRAM MANAGEMENT. Provide program management oversight and technical support for all CTTS R&D projects including funds from other agencies and management of cooperative research and development programs with the United Kingdom, Canada and Israel. Direct the program/project planning and execution for projects and associated contracts using direct and indirect budget allocations. Act as the interface to other government agencies for CTTS related initiatives and continuing and new projects. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency participation for the identification and

DDT 0 F DUDCET ITEM INCTIFICATION CHEET (D 4 FL.L.L.)		DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATU	JRE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support	
	PE 0603122D8Z	

prioritization of CTTS mission area requirements. Includes management and closeout of existing contracts and the solicitation for an increasing volume of new initiatives. Review and revise existing process and execution plans for CTTS mission area management and internal and external reporting responsibilities. (\$3.921 million)

(U) B. Program Change Summary	FY2001	FY2002	FY2003
President's FY2001 Budget Submission	49.929	50.754	39.451
DELTA	-1.077	-8.511	0.000
FY 02 Amended President's Budget Submission	48.852	42.243	39.451
Appropriated Value	49.307	56.443	0.000
Adjustments to Appropriated Value			
a. Congressionally Directed Undistributed Reduction	0.000	-0.432	0.000
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	-0.455	0.000	0.000
c. Other	0.000	0.000	9.564
Current FY 2003 Budget Submission	48.852	56.011	49.015

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE FEBRUARY 2002
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE
RDT&E, Defense Wide/BA 3	Combating Terrorism Technology Support
	PE 0603122D8Z

Change Summary Explanation:

- **(U)** <u>Funding</u>: FY 2001 reductions reflect Section 8086 adjustments. FY 2002 decrease reflects Congressional undistributed reductions. FY 2003 increases efforts in the areas of detection, personnel and infrastructure protection supporting national counter terrorism priorities.
- (U) Schedule: N/A
- (U) Technical: N/A
- (U) C. Other Program Funding Summary Cost: N/A
- (U) D. Acquisition Strategy: N/A
- (U) E. Schedule Profile: N/A